

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Docket No: Q78116

Michael SCHMIDT, et al.

Appln. No.: 10/697,120

Group Art Unit: 2613

Confirmation No.: 8458

Examiner: Thi Q. Le

Filed: October 31, 2003

For: RECEIVER FOR OTDM/PDM OPTICAL SIGNALS

PRE-APPEAL BRIEF REQUEST FOR REVIEW

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Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

Pursuant to the Pre-Appeal Brief Conference Pilot Program, and further to the Examiner's Final Office Action dated July 3, 2007, Applicant files this Pre-Appeal Brief Request for Review. This Request is also accompanied by the filing of a Notice of Appeal.

Current Claim Rejections. As set forth in the Office Action dated July 3, 2007, claims 1, 2, 6, and 7 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Widdowson et al., "Polarisation guiding in ultralong distance soliton transmission," *Electronics Letters*, Vol. 30, No. 11, 26 May 1994, pages 879-880 (hereinafter "Widdowson"). Claims 3-5, 8, and 9 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Widdowson in view of Heismann et al., "Automatic Polarization Demultiplexer for Polarization-Multiplexed Transmission Systems," *Proceedings of the European Conference on Optical Communications*, Vol. 2, 12 September 1993, pages 401-404 (hereinafter "Heismann"). For at least the reasons discussed below, Applicants submit that these rejections are improper, and request reversal of the outstanding rejections.

Brief Summary of the Cited References. Widdowson discloses a polarization division multiplexed (PDM) transmission system. In an experimental configuration that measures the mixing of polarization states when traveling along a transmission line, an OTDM demultiplexer is used to time division demultiplex the transmitted signal. Further, a polarizer is inserted in front of the OTDM demultiplexer to ensure that solitons from only one polarization state are detected. Heismann discloses a polarization demultiplexer for polarization multiplexed transmission systems.

None of the cited references, alone or in combination, teach or suggest a polarization selective element for separating from the isolated pulses at least one component that has a single polarization. This claim language requires that the polarization selective element be located behind the polarization insensitive optical switch, which isolates optical pulses within the pulse train. On the contrary, Fig. 1 of Widdowson shows that the polarizer is located in front of the demultiplexer in the experimental configuration (p. 880, first full paragraph).

Further, Applicants submit that it would not have been obvious to a person of ordinary skill in the art to reverse the order of the polarizer and demultiplexer of the receiver of Widdowson. As discussed in the current specification, isolating the optical pulses before separating the pulses of different polarizations allows a relaxation of the constraints imposed on the OTDM demultiplexer (specification, p. 4, fourth full paragraph). This is because components in the isolated pulses that result from interchannel interference can be largely eliminated by the subsequent polarization selective element (*Id.* at p. 5, first paragraph). Also, a demultiplexer with a greater switching window can be used, and the extinction ratio of the demultiplexer can be reduced (*Id.*). Therefore, the claimed receiver is structurally different and produces a different result than the receiver of Widdowson.

In response to this argument, the Examiner notes that “the features upon which applicant relies are not recited in the rejected claim(s).” However, Applicants are not describing these features as elements of claim 1. Instead, Applicants are explaining why it would not have been obvious to a person of ordinary skill in the art to reverse the order of the polarizer and demultiplexer of the receiver of Widdowson. In particular, the features show that the order of the polarizer and demultiplexer in the claimed invention achieves unexpected results, which is a secondary consideration of nonobviousness. Evidence of unexpected results is one example of rebuttal evidence that should be considered by the Examiner in reevaluating a determination of obviousness.¹

In addition, Applicants submit that Widdowson teaches away from reversing the order of the polarizer and demultiplexer in the receiver. The Examiner alleges that because the functionalities of the polarizer and the demultiplexer are not dependent upon each other, their functionalities would not have been affected by their placement within the receiver. According to the Examiner, a polarizer always has a function of separating the polarization states, and the demultiplexer always has a function of demultiplexing, regardless of the placement of these devices within the receiver. The Examiner asserts that a person of ordinary skill in the art would have recognized that the same result is achieved by placing the polarizer before or after the demultiplexer. Applicants respectfully disagree.

As discussed above, placing the demultiplexer before the polarizer provides several unexpected results that are not achieved if the order of the demultiplexer and the polarizer is reversed. Further, Widdowson is directed to a PDM system that doubles the capacity of soliton

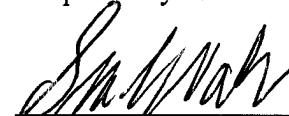
¹ See Examination Guidelines for Determining Obviousness Under 35 U.S.C. § 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*

transmission systems (p. 879, first paragraph). In a PDM system, two independent signals with orthogonal polarization states are separated at the receiver by a polarizer. However, two independent polarization multiplexed signals cannot be separated by an OTDM demultiplexer, because two bits with orthogonal polarizations arrive at the demultiplexer at the same time. Widdowson also discloses that if orthogonality is lost during transmission, the polarizer will no longer operate to separate the pulses. If the orthogonality is lost, an OTDM demultiplexer would be required, which would eliminate the advantages offered by the PDM system (*Id.*). In this case no polarizer would be required.

Fig. 3 of Widdowson shows an experimental configuration that is designed to measure the mixing of polarization states when traveling along a transmission line. The experimental configuration uses a polarizer to separate signals with orthogonal polarization states, and a subsequent OTDM demultiplexer to measure whether orthogonality is lost through polarization dependent loss, or whether the signals can still be sufficiently separated (p. 880, first two full paragraphs). Therefore, the demultiplexer is used only for measurement, and would not be used in actual PDM systems, because PDM systems can only operate if orthogonality is maintained. Further, reversing the order of the polarizer and the demultiplexer would not provide the desired experimental data in Widdowson.

Conclusion. In view of the foregoing, and in view of the arguments advanced above, Applicants submit that claims 1, 2, 6, and 7 are patentable over Widdowson. Further, because Heismann fails to remedy the deficient teachings of Widdowson, claims 3-5, 8, and 9 are patentable over Widdowson in view of Heismann. Applicants respectfully request reversal of the outstanding rejections.

Respectfully submitted,



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